ORIGINAL

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Section 2.106 of the	)	ET Docket No. 95-18
Commission's Rules to Allocate	)	RM-7927
Spectrum at 2 GHz for Use by	)	
the Mobile Satellite Service	)	

COMMENTS OF
CELSAT AMERICA, INC.

CELSAT AMERICA, INC.

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SUMMARY

Celsat America, Inc. ("Celsat") strongly supports the Commission's proposal to allocate 1990-2025 MHz and 2165-2200 MHz bands to MSS (the "new MSS Frequencies"). The Commission must expeditiously allocate the new MSS Frequencies to maintain the leadership of the United States in satellite and personal communications services, increase competition in the marketplace and spur the creation of domestic high technology jobs.

Celsat submits that the timely introduction of new MSS Frequencies will allow its hybrid satellite/cellular system to assist the PCS license winners and especially the "designated entities" in providing early coverage in the less populated portions of their service areas. This proposed system will increase the competitiveness of the PCS service providers and significantly reduce the initial infrastructure costs. Celsat submits that in order for its service to be most beneficial to the PCS license winners, the new MSS Frequencies should be allocated and awarded in 1995 for a satellite to be constructed and launched by 1998. If licensed, Celsat proposes to develop a dual band terminal unit which is capable of allowing access to both the terrestrial PCS system and Celsat's satellite network, which will allow this complementary service to be provided.

In addition, Celsat recommends that the Commission adopt rules to prevent substantially similar MSS providers from acquiring market power. Specifically, Celsat recommends prohibiting an MSS licensee and its affiliates in the 1.610-1.6265/2.4835-2.5 ("Big LEOs") and 1.544/1.6455 bands from holding a license in the new MSS Frequencies.

Celsat supports the Commission's 1990-2025 MHz band proposal to require broadcast auxiliary service ("BAS") incumbents to adopt more spectrum efficient equipment and to operate within the 85 megahertz at 2025-2110 MHz. Celsat maintains that the BAS incumbents use their existing spectrum inefficiently and therefore should be required to use more spectrally efficient equipment. Celsat strongly opposes the Commission's 1990-2025 MHz band proposal to require MSS providers to incur the costs of relocating BAS incumbents to a new 35 megahertz band as well as relocate fixed microwave incumbents.

Further, Celsat submits that the new 70 megahertz allocation should be reserved for GSO-exclusive services. Big LEOs have already been provided with more than an adequate amount of spectrum. Alternatively, the Commission should authorize new GSO licensees to operate on Big LEO spectrum. In addition, despite the fact that Celsat's satellites could be utilized to transpond any modulations or multiple access signals proposed for mobile use (e.g., GSM, CDMA, etc.), Celsat recommends that the Commission adopt CDMA for the new MSS Frequencies.

CDMA is the most spectrum efficient access method and it will allow all applicants to share the subject frequencies. In addition, CDMA would provide a mechanism to avoid mutual exclusivity among MSS applications, thereby speeding the licensing process and, in turn, the delivery of service to the public and the creation of jobs. Alternatively, if the Commission auctions the new MSS Frequencies, then the Commission must adopt measures to ensure participation by small businesses.

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Celsat America, Inc. ("Celsat"), by its attorneys, submits these comments in the above-captioned docket.

STATEMENT OF INTEREST

Celsat is a developer of a new class of wireless telecommunications services that will integrate both satellite and terrestrial communications services in a low-cost system known as "Hybrid Personal Communications Services" ("HPCS"). Celsat has previously filed a Pioneer's Preference request to deliver HPCS within the 2 GHz band.[1] In connection with its Pioneer's Preference request, Celsat filed a

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[1] Celsat appreciates that the Commission recognized in the NPRM that Celsat's Request for a Pioneer's Preference has been pending since February 10, 1992. Now that the Commission has proposed to allocate spectrum for Celsat's proposed service, Celsat respectfully requests timely action on this pending

(continued...)

Petition for Rule Making that was partly responsible for initiating the Notice of Proposed Rule Making.[2] Accordingly, Celsat has an interest in this proceeding.

INTRODUCTION

In the NPRM, the Commission proposes allocating the 1990-2025 MHz (Earth-to-space) and 2165-2200 MHz (space-to-Earth) bands to MSS (the "new MSS Frequencies"). The NPRM not only proposes to allocate these bands for both geostationary ("GSO") and non-geostationary (low-Earth orbit, or "LEO") satellites, but also requests comment on whether the Commission should reserve the spectrum exclusively for GSO or LEO services.

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[1](...continued)
request. To clarify, Celsat, Inc. was the original petitioner for the Request for a Pioneer's Preference. Celsat, Inc. assigned its rights, title and interest in the Request for Pioneer's Preference to Celsat America, Inc. (referred to herein as "Celsat"), which is jointly owned by Celsat, Inc. (82%) and CCI Sub, Inc. (18%), a wholly owned subsidiary of Cellular Communications, Inc. See Second Amendment to Request for Pioneer's Preference, RM-7927, ET File No. PP-28 (November 28, 1994). Celsat America, Inc. is now regarded as the legally eligible candidate for the subject Pioneer's Preference pursuant to Section 1.402(a).

[2] See Notice of Proposed Rule Making, ET Docket No. 95-18, FCC 95-39 (released Jan. 31, 1995) ("NPRM") at 1.

COMMENTS

I. The Commission Should License the New MSS Frequencies in 1995 in Order to Maximize their Benefit to the New PCS Licensees

Celsat submits that its HPCS system will offer complementary service to new PCS providers if it is permitted to operate by 1998. Specifically, Celsat submits that the smaller PCS providers, particularly the "designated entities" ("DEs")[3] would benefit from the early introduction of Celsat's system. Celsat's system would provide coverage across the United States with its first satellite and thereby assist PCS licensees in providing early coverage in the less densely populated regions of their licensed areas. In this manner, Celsat's system will significantly reduce their initial capital investment costs. By reducing such build-out expenses, such nascent market entrants will be in a better position to compete with incumbent Commercial Mobile Radio Service ("CMRS") providers in terms of price and service offerings. Therefore, Celsat's proposed system is a mechanism to facilitate the development of a fully competitive CMRS marketplace. Because, unlike other MSS proposals, Celsat's proposed system utilizes a very large (20 meter) dish, it can use small, low-powered, dual-mode, handheld portable satellite/PCS terminal

[3] DEs are small businesses, minority- and/or women-controlled businesses and rural telephone companies. Pursuant to the Omnibus Budget Reconciliation Act of 1993, the Commission must ensure the economic opportunity of DEs under a system of competitive bidding. See 47 U.S.C. § 309(j)(3).

units, Celsat is uniquely positioned to provide this complementary service. Thus, for Celsat's system to be most beneficial to the new PCS licensees, the new MSS Frequencies should be allocated and awarded in 1995 to provide for a 1998 satellite launch window.

In addition, Celsat recommends that the Commission adopt a flexible allocation scheme for the broadband PCS frequencies. Specifically, Celsat requests that the Commission broadly authorize the broadband PCS spectrum to be used on a secondary basis for any wireless telecommunications-related purpose provided that secondary licensee obtains the consent of the primary licensee. Celsat submits that adopting such a flexible allocation scheme would serve the interests of Section Seven of the Communications Act, 47 U.S.C. § 157, by encouraging the development of new technologies and services to the public, promoting the creation of competitive markets and domestic high technology jobs.

II. The Commission Must Adopt Rules to Prevent Substantially Similar MSS Providers from Acquiring Market Power

Celsat strongly supports the reallocation of 70 megahertz of 2 GHz spectrum for MSS. Celsat is concerned, however, that certain licensed providers of

1.610-1.6265/2.4835-2.5 ("1.6/2.4 GHz")[4] and 1.544/1.6455 ("1.5/1.6 GHz")[5] MSS services may seek to acquire the new MSS Frequencies and thereby achieve a dominant market position and stifle competition from new entrants.

Celsat recommends that the Commission adopt spectrum ownership restriction rules applicable to MSS providers. Specifically, the FCC should adopt an MSS spectrum ownership restriction prohibiting an MSS licensee and its affiliates in the 1.6/2.4 and 1.5/1.6 GHz bands from holding an MSS license in the 1990-2025/2165-2200 MHz bands.[6] For this purpose, the Commission should rely upon its existing definition of an "affiliate" used in connection with the PCS rules.[7] In addition, the Commission should calculate indirectly held ownership interests

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[4] This spectrum was awarded to non-GSO "Big LEO" MSS services.

[5] This spectrum was awarded to American Mobile Satellite Corporation ("AMSC").

[6] Because all MSS licensees have to raise significantly greater amounts of capital to construct, launch and operate their systems than broadcast or terrestrial-only CMRS licensees, and because there is a finite number of sources of telecom capital, Celsat submits that the ownership restriction apply to MSS licensees and their affiliates (e.g., entities in which MSS licensees hold controlling interests) rather than their "attributable" interests (e.g., interests of 5% or more) to establish a pragmatic competition policy for MSS services.

[7] See 47 CFR § 24.720(1). The affiliation rule in the PCS context was adopted to determine the actual financial size of an applicant. In the MSS context, the affiliation rule would be adopted to achieve the same purpose as the attribution rules (i.e., to ensure a competitive market), but by a more pragmatic threshold (i.e., a controlling interest rather than an interest of 5% or more).

through use of the Commission's traditional multiplier.[8] Adoption of these rules would prevent MSS licensees in the 1.6/2.4 GHz bands and the 1.5/1.6 GHz bands from inhibiting market competition from new entrants by acquiring and potentially wharehousing spectrum in the 1990-2035/2165-2200 MHz bands.[9]

Adoption of a competition policy for MSS is consistent with past Commission precedent and policy. The Commission has consistently applied attribution rules and spectrum ownership restrictions to prevent providers of substantially similar communications services from achieving market power. Specifically, the Commission adopted attribution rules and spectrum ownership restrictions to serve similar competition policy goals in the context of cellular/PCS cross-ownership,[10] maximum PCS spectrum ownership[11] and CMRS cross-ownership.[12] Thus, Celsat submits that adoption of this proposed restriction will serve the public interest by ensuring a competitive market for MSS services without unduly restricting sources of capital for new market entrants.

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8 See, e.g., 47 C.F.R. §§ 24.204(d)(2)(vii) and 73.3555, note 2(d).

9 Celsat notes that it has never applied for a license to operate on the 1.6/2.4 GHz MSS bands, although it did participate in the Big-LEO proceeding's Advisory Committee.

10 47 C.F.R. § 24.204. See also 47 C.F.R. § 73.3555.

11 Id.

12 47 C.F.R. § 20.9.

II. Celsat Supports the Commission's Proposal to Require Broadcast Auxiliary Service Incumbents to Adopt More Spectrum Efficient Equipment and to Operate within the 85 Megahertz at 2025-2110 MHz

In order to clear the spectrum proposed for the new MSS providers, the Commission seeks comment on three proposals. First, the Commission proposes to relocate broadcast auxiliary service ("BAS") incumbents in the 1990-2025 MHz band to the upper end of the BAS band at 2110-2145 MHz. The BAS relocation, however, would create a conflict with existing private and common carrier fixed microwave services operating in the 2110-2145 MHz band. Thus, the NPRM proposes to require new MSS providers to pay the full costs of relocating both the BAS and the microwave incumbents ("first 1990-2025 MHz band proposal"). Second, the Commission seeks comment on requiring BAS incumbents to adopt more spectrally efficient technology and to continue operating within the remaining 85 megahertz allocated to BAS at 2025-2110 MHz without relocating ("second 1990-2025 MHz band proposal"). Third, the Commission requests comment on moving BAS operations over time to a higher frequency band other than the proposed 35 megahertz band ("third 1990-2025 MHz band proposal").

Celsat supports the Commission's second 1990-2025 MHz band proposal requiring BAS incumbents to use more spectrum efficient technology within the remaining 85 megahertz of the 2025-2110 MHz band. The Commission has

authority to require incumbent licensees to use more spectrally efficient equipment[13] and has recently proposed to do so in the private land mobile "Refarming" proceeding.[14] This solution would serve the Commission's spectrum management goals within the BAS service without forcing MSS providers to incur unnecessary BAS relocation costs in addition to the high costs associated with launching, constructing and operating an MSS service.[15] Regardless of which spectrum clearing solution is ultimately adopted, Celsat emphasizes that BAS incumbents should not be relocated to spectrum that would only create unnecessary relocation costs for MSS providers.[16]

Regarding the microwave incumbents, Celsat recommends that the Commission allow MSS providers to relocate such incumbents incrementally as the need for clear spectrum arises. This flexibility would not only conserve Commission and licensee resources in resolving disputes over the relocation process, but will

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[13] See 47 U.S.C. §§ 303 (g) and (r).

[14] Replacement of Part 90 by Part 88 to Revise the Private Land Mobile Services and Modify the Policies Governing Them, Notice of Proposed Rule Making, 7 FCC Rcd 8105 (1993).

[15] 47 U.S.C. § 151.

[16] Celsat notes that some prospective MSS providers are engaged in discussions with incumbent BAS licensees concerning the 1990-2025 MHz band proposals. Although Celsat commends any cooperative efforts by the parties and the Commission to resolve issues in this proceeding, Celsat recommends that the Commission not allow such discussions to delay the adoption of final rules.

also allow MSS licensees to use their financial resources to construct and operate their systems to the benefit of the public rather than in protracted litigation.

Celsat submits that its technology allows its MSS service to co-exist with a significant number of incumbents without causing or being susceptible to interference. Celsat commissioned detailed investigations based upon the Commission's Enhanced Microwave Environmental Link File ("EMELF") database which revealed that a surprisingly large fraction of the area-bandwidth product of the fixed microwave usage over the U.S. in the 2165-2200 band is clear and available to a sufficiently smart and agile "frequency gleaner" in spite of the high level of present fixed microwave usage. Celsat's satellite design incorporates several features that facilitate such frequency gleaning:

1. Band segmentation by 1.25 MHz sub-bands,
2. A flexible system for user allocation and reallocation among sub-bands,
3. Essentially continuous position monitoring on each user.

With Celsat's technology, accurate position determination can be obtained through two-dimensional multi-lateration. Each user unit's transmitted spreading code is synchronized to the epoch of reception of the pilot signal from the satellite. The normal mode of operation will be two dimensional, i.e. based upon two receptions at two satellite nodes of the user response code. When used with certain existing information in a topographic data base, (e.g., altitude of the surface

of the earth), this feature provides position accuracy which is more than adequate for the system's avoidance protocol.

In normal operation, with two or more satellite sites receiving each mobile, the system user's position will be known accurately enough to determine which (if any) individual fixed microwave site exclusion zone it is in, and the user's transceiver will be commanded to utilize a non-interfering sub-band.

The performance of this exclusion protocol can be evaluated in terms of how much usable spectrum it makes available and whether any negotiated moves of the fixed microwave sites would be required to achieve a satisfactory level of service throughout the United States. To this end, a series of database studies were carried out using the Commission's EMELF database. Celsat found that more than 95% of the U.S. is free of interference for at least one 1.25 MHz sub-band within the 2165-2200 bands without the need to relocate incumbents. Thus, if the BAS users lose eligibility for (or are relocated from) the 1990-2025 band to make spectrum available for MSS, Celsat submits that the fixed microwave users can be relocated at a slow pace coincident with MSS subscriber growth.

III. The New 70 Megahertz Allocation Should Be Reserved for GSO-Exclusive Services

The NPRM reserves for a future proceeding the MSS service rules and licensing issues but requests comment on whether the new MSS Frequencies should be limited to exclusive GSO or LEO use. Because the Commission already has allocated a generous amount of MSS spectrum for exclusive non-GSO use at 1.6/2.4 GHz and 1.5/1.6 GHz, Celsat strongly supports allocating the new 70 megahertz of MSS spectrum for exclusive GSO use. Such a decision would, together with the adoption of attribution and spectrum ownership rules, ensure a diversity of MSS service providers and encourage technological innovation and increased competition in the delivery of MSS services.[17] In the event the Commission declines to allocate the new 70 megahertz for exclusive GSO use, the Commission should change the Big LEO rules to permit GSO use of such spectrum, and should permit new applications in that spectrum.

IV. The Commission Should Adopt CDMA for the New MSS Frequencies

The NPRM requests comment on whether the Commission should adopt a particular access method such as Code Division Multiple Access ("CDMA"). Celsat's satellites can function with any known mobile modulation or access technique (CDMA, GSM, etc.). Celsat strongly recommends that the Commission adopt

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[17] 47 U.S.C. § 309(j).

CDMA because it is the most spectrally efficient access technology, and it will enable all MSS applicants to share the new MSS Frequencies.[18] Celsat submits that the adoption of CDMA will allow it to eventually introduce innovative and technologically advanced services such as personal video telephony, high speed telemetry, etc. In CDMA (or, more generally, spread spectrum),[19] each user generates a unique wideband reference signal many times wider than its information bandwidth, modulates information onto it, and transmits the resulting wideband signal across the entire shared band with all the other band users. Each particular information signal is segregated securely from all others in the same band by correlation detection techniques that use a reference signal identical to, and synchronized with, a corresponding unique reference used at the transmitter. Under this sharing technique all users have the benefit of equal access to and use of the full band allocation, thereby

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[18] Celsat's support for CDMA as the access technology for the new MSS Frequencies is contingent on there being an open licensing policy for CDMA patents. As part of the ANSI/TIA PCS standards accreditation process, CDMA intellectual property owners have agreed to license their intellectual property rights on a non-exclusive, non-discriminatory basis. Celsat recommends that the Commission insist that any party that licenses a PCS CDMA standard in this manner to also license the standard for satellite use on the same non-exclusive, non-discriminatory basis.

[19] The term "CDMA" may be read herein as synonymous with "Spread Spectrum" because most current non-military Spread Spectrum systems are almost universally CDMA.

permitting the band to be used more functionally and efficiently.[20] Therefore, as described below, Celsat submits that CDMA provides significant performance advantages for MSS.[21]

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[20] The efficiency benefits can be analogized to those of a T-1 circuit used in telephony versus 24 individual VG channels. The former (i.e., 24 channels used as a common trunk group) not only permits much greater traffic efficiency, but also by allowing access to all 24 channels as a working group, it is possible to carry traffic at greater data speeds than would be possible over each circuit operated alone (i.e., greater functionality).

[21] Two main properties underlie the advantages claimed for CDMA:

(a) The spread ratio or processing gain, W/B (where B is the voice information bandwidth, W the spread bandwidth), should meet or exceed some minimum value, on the order of 15 to 20 db. For a 5 kbps information stream, for example, this would imply a minimum spread bandwidth of the order of 1 MHz.

(b) The transmitted signal should have a noise-like quality, that is, the power spectrum should be essentially uniform over the spread bandwidth, so that the most narrow banded victim receivers of its interference should not detect significantly (i.e., one or two db) more than B/W of the total energy (where B is the victim receiver bandwidth, and W the spread spectrum).

1. *CDMA Affords More Energy Efficient Coding*

In a Frequency Division Multiple Access ("FDMA") system there is generally a critical trade-off between transmission bandwidth and Forward Error Coding Gain. More powerful, lower rate, higher gain coding can save transmitter power, but generally only at the expense of greater transmission bandwidth and, ultimately, in a limited bandwidth at the expense of capacity.

In CDMA, as a practical matter, there is no transmission bandwidth nor processing gain penalty for the use of more powerful, very low-rate coding. Therefore, with CDMA it is possible to use higher gain coding with consequent reduction of transmitter power, intersystem interference, and aggregate gain in band capacity. Because mobile satellite communications systems are all power limited, CDMA would permit more circuits and allow for access by a greater number of users.

2. *CDMA Enables Greater Tolerance of Incumbent Transmitter Interference*

Historically, the pervasive use of CDMA by the military was primarily to exploit its unique anti-jamming capability. Specifically, CDMA demonstrated an ability to tolerate interfering signals which would jam an FDMA system. Because this is not the aim of an MSS design, the amount of interference protection or processing gain afforded in a typical MSS CDMA service would be much less,

typically only 10-20 dB. Nevertheless, in some cases, this feature improves the ability of a CDMA MSS system to tolerate interference from other incumbent spectrum users.

3. *CDMA Provides Greater Protection to Incumbent Services*

For closely related reasons, a CDMA signal is less likely to interfere with incumbent users, thereby permitting a greater tolerance to share on an inter-service basis. In military applications this property is exploited for LPI (Low Probability of Intercept) requirements. Again, the amount of gain is proportional to the processing gain, typically, 15-20 dB in the anticipated MSS service.

4. *CDMA Offers Greater Frequency Re-use Factor*

For the same reasons as numbers 2 and 3 above, the CDMA signal is also more tolerant of interference from neighboring transmitters in its own system. With an FDMA cellular (ground or MSS) system, it is commonly necessary to isolate frequency re-users from one another by one or more cell diameters. Commonly this results in cellular "cluster" sizes of $n=7$ to 13, meaning that only $1/n^{th}$ of the total spectrum allocation can be used in each cell.

A CDMA system can inherently tolerate a much higher level of system self-interference and frequently uses a cluster of $n=1$, meaning the frequency is completely re-used in every cell, resulting in overall regional spectral efficiency (circuits per MHz) many times greater than that of an equivalent FDMA system.

5. *CDMA Enhances Ability to Share with Other MSS*

For the same reason as number 2 above, CDMA systems have an inherently greater ability to share the use of a common band on an intra-service basis with like MSS services. Therefore, CDMA leads to a further increase in the frequency re-use factor, greater spectrum utilization efficiency and enhanced competition. This result was amply demonstrated during the FCC's negotiated rulemaking sessions related to the Big LEO bands. Whereas Motorola Satellite Communications, Inc., as the only non-CDMA applicant, required unique spectrum, six other companies (Loral/Qualcomm Partnership, L.P., TRW, Inc., American Mobile Satellite Corporation, Constellation Communications, Inc., Mobile Communications Holdings, Inc. and Celsat) all offered to share the spectrum, and all proposed to use CDMA.[22]

6. *CDMA Position Determination Is Inherent*

A CDMA receiver is required to synchronize its local spread spectrum reference generator to that of the received signal, regardless of the delay, to arrive at the receiver. Therefore, it provides a highly accurate measure of the transit time. Several measurements of this kind form the basis of position determination with an accuracy proportional to the channel or spread bandwidth. A non-CDMA system, such as an FDMA or TDMA system, could theoretically make the

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[22] See Report of the Majority of the Active Participants of Informal Working Group 1 to Above 1 GHz Negotiated Rulemaking Committee (April 2, 1993).

same type of measurement but only with a smaller channel bandwidth and less accuracy than CDMA.

7. *CDMA Enables Efficient, Multipath Reception*

As is frequently the case in mobile services, if the received signal arrives at the receiver via multiple paths of different delays separated by more than the reciprocal of the spread bandwidth, then the receiver will ignore those multipath signals that are not being tracked. This factor largely obviates the multipath interference fading such signals would otherwise induce in a narrowband system such as FDMA.

8. *CDMA Is Compatible With the Emerging CDMA Ground PCS Standard*

CDMA is a fundamental and essential element of what Celsat and many others regard as an emerging ground PCS standard. Celsat submits that CDMA will become a ground digital standard of choice for emerging technologies such as PCS and MSS. In addition, CDMA provides the best means to permit the inevitable integration of ground and space-based mobile systems in a "*Single Mode*," which will cost less to manufacture and purchase, will be lighter and will require less power than "Dual Mode" systems.

9. *CDMA Would Avoid Mutual Exclusivity and Thereby Speed the Licensing Process*

Celsat submits that because CDMA allows for the sharing of the new MSS Frequencies by the applicants, its use could avoid mutual exclusivity. Pursuant to Section 309(j), the Commission is encouraged to utilize available engineering methods that can avoid mutual exclusivity. In the absence of mutual exclusivity, the Commission would not auction the MSS license applications. Accordingly, CDMA would achieve the equitable result of licensing the new MSS applicants in the same manner as the first three 1.6/2.4 GHz MSS providers -- without auctions.[23]

Accordingly, although Celsat's satellite can provide very low cost service for any proposed terrestrial or space mobile modulation/access technique, Celsat submits that CDMA would serve the Commission's spectrum management goals to provide rapid, efficient, nationwide and worldwide MSS service.[24]

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[23] See Melody Music v. FCC, 345 F.2d 730, 732-733 (D.C. Cir. 1965) (requiring the Commission to treat similarly situated applicants in a similar manner).

[24] 47 C.F.R. § 151.

V. If the Commission Auctions the New MSS Frequencies, then the Commission Must Adopt Measures to Ensure Participation by Small Businesses

Celsat opposes the imposition of auctions on new MSS Frequencies applicants because it would provide the three LEO licensees that were awarded *free* MSS licensees on January 31, 1995 with an unfair competitive advantage. Nevertheless, if auctions are imposed, Celsat recommends that the Commission adopt similar measures in the MSS context for small businesses that it adopted for the PCS auctions. Specifically, Celsat recommends that the Commission provide small MSS applicants with a 15% bidding credit and the following government financing terms: (a) interest imposed based upon the rate for a 10-year U.S. Treasury obligation applicable on the license grant date, (b) interest-only for the first five years, and (c) principal and interest amortized over the remaining five years of the license term.[25]

The Commission should deem an MSS applicant qualified as a small business if it, together with its financial affiliates, has annual gross revenues of not more than $125 million and total assets of not more than $500 million.[26] The

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[25] These recommended financing terms are more favorable than those adopted for small broadband PCS applicants to reflect the greater costs of launching, constructing and operating an MSS system.

[26] This size standard was adopted for "entrepreneurs" in the broadband PCS auction context. See 47 C.F.R. § 24.709. "Small" PCS businesses are defined as qualified entrepreneurs that, together with their affiliates, have average gross revenues for the preceding three years of not more than $40 million. See 47 (continued...)

applicant's control group of qualifying investors should own at least 25% of the applicant's total equity and 50.1% of the applicant's total voting stock or, in the case of partnerships, 50.1% of the partnership's total equity, including all of the general partnership interests. The remaining equity could be held by passive investors, the revenues and assets of which would not count towards the applicant's financial qualification provided that no single investor holds more than 25% of either the applicant's total equity or the total voting stock. In addition, Celsat supports the application of the Commission's existing financial affiliation rules to the MSS context in the event MSS spectrum is auctioned.[27]

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[26](...continued)
C.F.R. § 24.720. Celsat submits that the PCS small business definition is unrealistically small for MSS. See n. 22, infra.

[27] In this context, Celsat supports the use of the Commission's financial affiliation rules to determine the actual financial size of MSS applicants. As discussed in Section I, infra, Celsat also supports the application of the affiliation standard to determine "controlling" interests as part of an MSS market competition policy.